No. 707,211. Patented Aug. 19, 1902.

J. B. CORNWALL.

RICE HULLING MACHINE.

(Application filed May 6, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

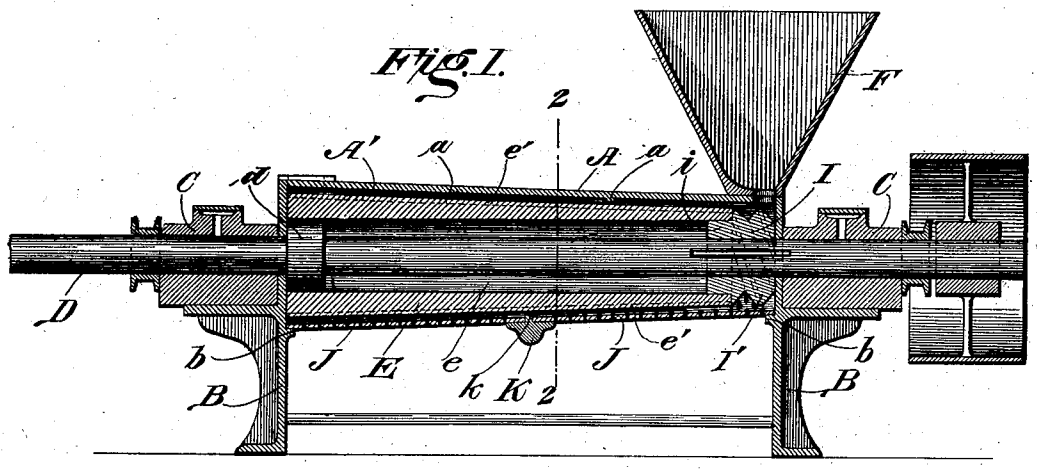


Fig. 2.

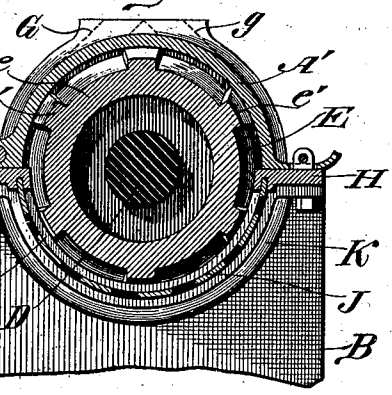


Fig. 5

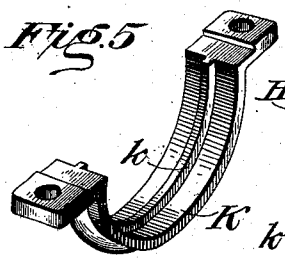


Fig. 4.

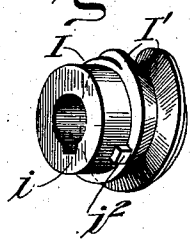


Fig. 3.

Witnesses
M. C. Fowler
James R. Mansfield.

Inventor:
John B. Cornwall
By Alexander & Fowell
Attorneys

No. 707,211. Patented Aug. 19, 1902.

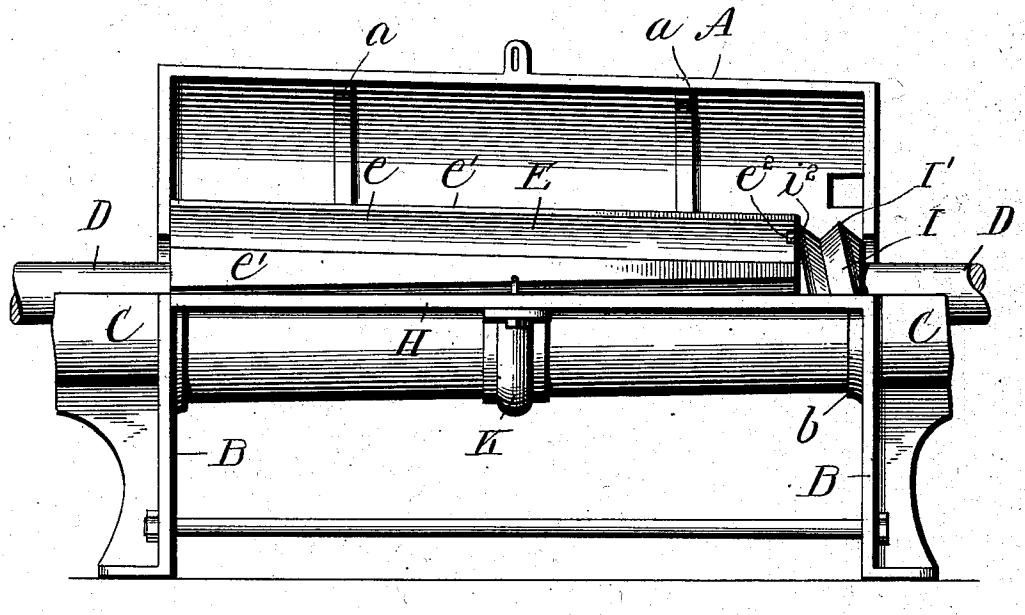
J. B. CORNWALL.

RICE HULLING MACHINE.

(Application filed May 6, 1901.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.



WITNESSES:
Wm. F. Doyle.
James R. Mansfield.

INVENTOR
John B. Cornwall.
BY Alexander Bowell
Attorneys

UNITED STATES PATENT OFFICE.

JOHN B. CORNWALL, OF MOLINE, ILLINOIS, ASSIGNOR TO BARNARD AND LEAS MANUFACTURING COMPANY, OF MOLINE, ILLINOIS.

RICE-HULLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 707,211, dated August 19, 1902.

Application filed May 6, 1901. Serial No. 58,895. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. CORNWALL, of Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Rice-Hulling Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in rice-hulling machines of the kind shown in patent to H. A. Barnard, No. 586,090, dated July 13, 1897; and the object of this invention is to produce a more simple and less expensive machine without lessening the efficiency thereof.

To this end the invention consists, first, in the novel construction of the hulling-cylinder, which is preferably made in three parts, with the hulling-ribs cast integral therewith and tapered in width to have a shear action against the hulling plates or knives and which will enable the machine to be used for a double length of time without renewing the ribs by simply reversing the rotation of the cylinder; second, in the novel construction of the force-feed screw, which is utilized as a support or part of the cylinder; third, in an arrangement of baffles within the casing, whereby the passage of unhulled grain through the machine is prevented; fourth, in a novel construction of parts whereby the screens or perforated plates are supported and retained in place, and, finally, in the general construction and combination of parts hereinafter described and claimed.

The accompanying drawings illustrate a scourer embodying the invention, and therein—

Figure 1 is a longitudinal vertical section through the complete machine. Fig. 2 is a transverse section on line 2 2, Fig. 1. Fig. 3 is a detail view of the hulling-cylinder shell detached; Fig. 4, a view of the conveyer detached; Fig. 5, a detail view of the screen-plate support detached. Fig. 6 is a front elevation of the machine, the upper half of the conical casing being thrown back, showing the taper of the ribs and their relation to the hulling-ribs H.

The machine is in general form and appearance like that shown in the Barnard patent above mentioned, comprising a conical casing A, mounted on suitable standards B, upon which are journal-boxes C for the main shaft D, carrying the hulling cylinder or cone E. The casing is divided horizontally, so the upper half A′ thereof can be thrown back to facilitate the assembling, cleaning, or repairing of parts and is provided with a feed-hopper F at its small end and discharge-openings G *g* at its larger end.

The hulling cylinder or cone E comprises a conical shell *e*, open at each end and cast with a series of equidistant projecting longitudinal ribs *e′* on its periphery, these ribs tapering or diminishing in width from the larger toward the smaller end of the shell for the purpose of producing a shear cut or shearing action between the ribs *e′* and the hulling blades or plates H, attached to the frame or casing at diametrically opposite sides of the cylinder, as shown. The tapering of ribs *e′* prevents their edges coming parallel with the edges of blades H, and thus produces the shear action above mentioned.

The larger end of shell *e* is supported and centered on shaft D by bushing *d*, attached to the shaft and fitting within the shell, as shown. The smaller end of the shell is supported and centered on the shaft by a force-feed-screw casting I, which has an annular shoulder *i*, fitting within the shell, and said shell and feed-screw are formed with interlocking ribs and notches i^2 e^2, as shown, so that the shell is rotated with and by the feed-screw casting which is keyed or splined on the shaft D. This casting I also has a spiral flange or flanges I′, by which the material is properly forced into the casing and fed through the machine.

When ribs *e′* become worn on one edge, so that the machine does not work efficiently, casting I can be removed and replaced by a similar but oppositely-threaded feed-screw casting and the main shaft then driven in the opposite direction, thus practically renewing the machine with little expense and doubling its life.

The upper half of the casing may be formed of a single casting A′ and is preferably im-

perforate, except for the feed and discharge openings. It is provided, however, with transversely-arranged inwardly-projecting semi-annular ribs *a a*, which serve as baffles to prevent direct flow or passage of grain through the machine and compel it to pass between the ribs *e'* and hulling-plates H repeatedly. The bottom of the casing is ordinarily composed of perforated screen-plates, and, as shown, I employ two plates J J, the side edges of which are fitted under the hulling-plates H. Their outer ends are supported on semicircular flanges *b* on the end plates or standards B of the casing, and their adjoining inner ends are supported on an inverted arch-bar casting K, which is bolted to the opposite side bars of the frame, as shown, at the center of the casing, and is the only fastening required to hold the screens J in place. This arch is provided with a central longitudinal rib *k* on its inner face, which projects inward toward the cone and beyond the plates and, like the ribs *a*, forms a baffle and prevents the grain from being carried along inside the casing without passing between the hulling ribs and knives or plates. These baffles *a k* prevent unhulled grain passing through the machine from feed-openings to discharge and enables the machine to do thorough and complete hulling, allowing no unhulled rice or grain to pass to the discharge, which has not heretofore been accomplished.

The force-feed screw I is quite important to the successful operation of the machine, as the thoroughness of the hulling operation depends upon the compactness and pressure of the mass of grain passing through the machine. The principal features of novelty in the device are the separable feed-screw and shell, the baffles and the tapering ribs on the cone, and the combinations thereof. The mode of operation of the machine is substantially similar to that of the Barnard machine above referred to, and no detailed explanation thereof is necessary.

Having thus described my invention, what I therefore claim as new, and desire to secure by Letters Patent thereon, is—

1. The combination of a casing, a longitudinal hulling plate or knife, and a revoluble hulling-cylinder having tapered longitudinal hulling-ribs adapted in conjunction with the knife to effect a shear cut in either direction of revolution of the cylinder.

2. In a rice-huller, the combination of the casing, the hulling plates or knives, and hulling-cylinder provided with longitudinal tapering hulling-ribs adapted in conjunction with said plates to effect a shear cut in either direction, with transversely-disposed baffles within the casing, substantially as described.

3. In a rice-huller, the combination of the casing, the hulling plates or knives therein, the hulling-cylinder having longitudinal tapering hulling-ribs adapted to effect a shear cut in either direction, and force-feed flanges at its feed end, all substantially as described.

4. In a rice-huller, the combination of the casing, the hulling plates or knives therein, the conical hulling-cylinder having longitudinal tapering hulling-ribs adapted to effect a shear cut in either direction, and the removable force-feed-screw casting supporting the smaller end of the cylinder upon the main shaft, all constructed and adapted to operate substantially as described.

5. In a rice-huller, the combination of the casing, the main shaft, and the hulling plates or knives at opposite sides of the casing; with the hulling-cylinder intermediate the knives having longitudinal tapered hulling-ribs adapted to effect a shear cut in either direction, and transversely-disposed baffle-ribs within the casing all adapted to operate substantially as described.

6. In a rice-huller, the combination of the casing, the main shaft, and the hulling plates or knives at opposite sides of the casing, and the conical hulling-cylinder intermediate the knives having longitudinal tapered hulling-ribs adapted to effect a shear cut in either direction; with transversely-disposed baffles above and below the cylinder, and a force-feed screw at the smaller end of the cylinder, all adapted to operate substantially as described.

7. In a rice-huller, the combination of the frame, the arch-bar suspended therefrom, having an internal inwardly-projecting baffle-rib, the screen-plates having their inner ends supported by said bar; the hulling plates or knives, and the hulling-cylinder, substantially as described.

8. In a rice-huller, the combination of the frame, the arch-bar suspended therefrom, having an internal inwardly-projecting baffle-rib, the screen-plates having their inner ends supported by said bar; the hulling plates or knives, and the hulling-cylinder; with the removable force-feed screw on said shaft supporting and interlocked with the adjoining end of the cylinder, substantially as described.

9. In a rice-huller, the combination of the frame, the arch-bar suspended therefrom, having an internal inwardly-projecting baffle-rib, the screen-plates having their inner ends supported by said bar and the upper half of the casing having internally-projecting baffle-ribs; with the hulling plates or knives, the main shaft, the conical hulling-cylinder thereon having longitudinal tapered hulling-ribs, and the removable force-feed screw on said shaft supporting and interlocked with the smaller end of the cone, all constructed and adapted to operate substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JOHN B. CORNWALL.

In presence of—
H. S. HANSON,
W. H. HILLHOUSE.